

## ABSTRACT OF THE DISCLOSURE

5           An ultra low NOx burner for process heating is provided which includes a fluid  
based flame stabilizer which provides a fuel-lean flame at an equivalence ratio in the  
range of  $\phi = 0.05$  to  $\phi = 0.3$  and fuel staging lances surrounding the flame stabilizer in  
circular, flat, or load shaping profiles, each lance comprising a pipe having a staging  
nozzle at a firing end thereof, each lance having at least one hole for staging fuel  
10 injection, and each hole having a radial divergence angle and an axial divergence angle.  
The at least one hole and the divergence angles provide circular, flat or load shaping  
flame pattern. The burner provides NOx emissions of less than 9 ppmv at near  
stoichiometry combustion conditions.

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